
Space Weather Forecast

Issued on Thursday, 08 February 2024 at 13:23 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Moderate activity and isolated R1-R2 Radio Blackouts expected Day 1 (08 Feb) then likely Days 2-4 (09-11 Feb). Chance of isolated Strong flares which may produce R3 Radio Blackouts, risk mainly Day 1 (08 Feb).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate, with isolated Moderate class flares, the peak flare at 07/1805 UTC from a moderately sized and magnetically complex region that lies on the southwest limb. There are eleven other sunspot regions on the visible disc, however the majority of these are small and relatively stable. The most significant region remains a large and magnetically very complex region in the southeast. Magnetic looping is evident in SDO imagery between this region, and several other regions on the southeast disc in close proximity.

No Earth-directed Coronal Mass Ejections (CMEs) were observed on available imagery during the past 24 hours.

Solar Wind / Geomagnetic Activity: Solar winds, as measured by ACE and DSCOVR at L1 have predominantly remained at slightly elevated levels, with occasional periods of elevated wind speeds. Winds are currently around 480-500 km/s, peaking at 549 km/s at 07/2114 UTC. The Interplanetary Magnetic field (IMF) was weak. The important north-south component fluctuated weakly, but has been largely southwards oriented since 08/0908 UTC. Geomagnetic activity was Quiet (Kp 0-1).

Energetic Particles / Solar Radiation: The count rate of energetic particles remained at background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate activity expected Day 1 (08 Feb), with isolated Moderate flares and a chance of Strong flares. These most likely from two large and complex regions, one in the southeast disc and the other complex region on the southwest limb. The flare risks reduce slightly as the southwestern sunspot region departs the disc, however new or returning regions maintain a likelihood of Moderate activity Days 2-4 (09-11 Feb).

Solar Wind / Geomagnetic Activity: Wind speeds are expected to remain at predominantly slightly elevated levels Days 1-2 (08-09 Feb) before eventually declining to slow-ambient levels on Day 3 (10 Feb). There is a low probability of connection to a HSS from CH97/+ producing enhancement Days 3-4 (10-11 Feb). A CME that left the Sun in association with the Moderate flare early 06 Feb may provide a slight glancing blow late Day 2 or early Day 3. Geomagnetic activity is expected to be mostly Quiet (Kp 0-2), with a chance of Unsettled intervals (Kp 3) and a very slight chance of a G1/Minor Geomagnetic Storm interval (Kp 5), should any CME enhancement occur Days 2-3.

Energetic Particles / Solar Radiation: The count rate of energetic particles has a chance of rising above background in response to any large flares that may occur. This brings a chance of reaching S1/Minor Solar Radiation Storms on Day 1 (08 Feb). The risk lowers to a slight chance from Day 2 (09 Feb) as the moderately sized, and magnetically complex, region in the southwest rotates fully beyond the western limb.

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Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	1	5	10	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	Yes	70	60	60	60
Very Active	R3 to R5 X	No	20	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	20	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)